— Provisions for temporary placement of Scientists and Technocrats under the scheme of Scientists Pool.

— Creation of supernumerary Posts.

— Invitation to distinguished men and women of Indian origin settled abroad for short term technical assignments to assist in frontier and emerging areas of S&T.

— Creation of a Special Cell in the Ministry of Industry for assisting non-resident Indians for setting up of industrial units in this country. Some states have also set up special cells and Departments for this.

— Provision of facilities for import of equipment for professionals returning from abroad.

Study of Jupiter Collisions

446. MISS SAROJ KHAPARDE: Will the PRIME MINISTER be pleased to state:

(a) whether it is a fact that a group of Indian Scientists have been studying the impact of the Shoemaker Levy Nine Comet's collision with the planet Jupiter; and

(b) if so, what are the details of the findings of the study by the group?

THE MINISTER OF STATE IN PRIME MINISTER'S OFFICE AND MINISTER OF STATE IN DEPARTMENTS OF ATOMIC ENERGY, SPACE AND IN THE MINISTRY OF SCIENCE AND TECHNOLOGY (SHRI BHUVNESH CHATURVEDI): (a) Yes, Sir. Scientists from several organisations in the country have been studying the impact of Comet Shoemaker Levy-9 with the planet Jupiter.

(b) 200 high quality images of this collision wtre obtained through 6 filters in various wavelength ranges by the Indian Institute of Astrophysics (ILA), Bangalore from the Vainu Bapu Observatory, Kavalur. These images indicate that the collision was powerful and left prominent changes in the visible appearance of the atmosphere of Jupiter. Change in the intensity of methane bands and emission of intense radiation from heated clouds of gas (which mushroomed over the atmosphere) were noticed.

Series of fast images were obtained at Japal Rangapur Observatory, Hyderabad with the help of a CCD Camera. The photographs obtained show the dark regions of crash sites.

Techniques of radio astronomy were also employed to monitor this event. Scientists at the Raman Research Institute, Bangalore detected several fold increase in micro emission from Jupiter lasting for a new minutes after the impact of the E-component.

Analysis and interpretation of the large amount of data collected by various groups are expected to continue for some time come.

Indo-Ukraine joint space research project

447. SHRI RAHASBIHARI BARIK: Will the PRIME MINISTER be pleased to state:

(a) whether some joint space research projects are proposed to be launched by India and Ukraine;

(b) if so, what are these space research projects;

(c) by when these projects are proposed to be launched; and

(d) the steps taken in the matter?

THE MINISTER OF STATE IN PRIME MINISTER'S OFFICE AND MINISTER OF STATE IN THE MINISTRY OF SCIENCE & TECHNOLOGY AND MINISTER OF STATE IN THE DEPARTMENTS OF ATOMIC ENERGY AND SPACE (SHRI BHUVNESH CHATURVEDI): (a) Yes, Sir.

(b) and (c) The Umbrella Agreement between India and Ukraine on cooperation in Space has been signed

in September 1994. Specific Projects to be taken up under this Agreement are yet to be finalised.

(d) Proposals for Joint Projects are under consideration with regard to mutual interest and feasibility.

Launch of PSLV-II

448. DR. SHRIKANT RAMCHANDRA JICHKAR: Will the PRIME MINISTER be pleased to state:

(a) what are the salient features of the launch of the PSLV-II;

(b) whether the launch took place as expected or it deviated from the expectation and if so, to what extent; and

(c) what would be the applied benefits of this satellite?

THE MINISTER OF STATE IN THE PRIME MINISTER'S OFFICE AND MINISTER OF STATE IN THE MINISTRY OF SCIENCE & TECHNOLOGY AND MINISTER OF STATE IN THE DEPARTMENTS OF ATOMIC ENERGY AND SPACE (SHRI BHUVNESH CHATURVEDI): (a) and (b) The obective of PSLV D2 was to evaluate the vehicle systems in flight and inject 804 kg. IRS-P2 satellite into a polar sun-synchronous orbit. PSLV employs both solid and liquid propellant systems and sophisticated initial navigation systems. The 44m tall four stage PSLV has a take-off weight of 283 tonnes. The first stage solid motor is the third largest of its class in the world. The second and fourth liquid stages were flown for the first time in USLV. The third stage is an advanced solid motor employing composite motor case. PSLV uses a variety of complex systems and aerospace mechanisms. The performance of tht launch vehicle was as predicted and the satellite was injected into the desired orbit.

(c) The Indian Remote Sensing (IRS-P2) Sattllite, launched by the Polar Satellite Launch Vehicle (PSLV-D2), is fully operational and the data from the satellite is used in conjunction with the data available from other Idian Remote Sensing Satellites. IRS-IA & IB. Specifically, IRS-P2 is providing continuity of date services to the user community and its data issued in many of the natural resources survey and management projects. Also, IRS-P2, along with IRS-IA & IB, has been providing data coverage of the country with a combintd repetitivity of 7-8 days and thus has enhanced the capability of monitoring dynamic changes.

Monitoring of IRS Satellite from Mauritus-based station

449. SHRI SURINDER KUMAR SINGLA:

DR. SHRIKANT RAMCHANDRA JICHKAR:

Will the PRIME MINISTER be pleased to state:

(a) in what manner the Satellite Control station, located in Mauritius to regularly track ad monitor the Indian Remote Sensing Satellite is functioning;

(b) what is then amount of money we are spending on this Centre;

(c) the purpose of locating the Centre in Mauritius; and

(d) what is the extent of cooperation the Govtrnment of Mauritius is extending in this regard?

THE MINISTER OF STATE IN PRIME MINISTER'S OFFICE AND MINISTER OF STATE IN THE MINISTRY OF SCIENCE & TECHNOLOGY AND MINISTER OF STATE IN THE DEPARTMENTS OF ATOMIC ENERGY AND SPACE (SHRI BHUVNESH CHATURVEDI): (a) The Satellite Telemetry, Tracking and Command station at Mauritius is providing very good support for the Indian Remote Sensing Satellites

(b) The budget allocation for the maintenance of the station in 1994-95 is Rs. 95 lakhs.

(c) Mauritius is geographically well suited for moitoring Indian Remote Sensing (IRS) satellites.